

Appl. No. 09/967,224
Amdt. dated October 14, 2003
Reply to Office action of August 12, 2003

REMARKS/ARGUMENTS

Claims 17-19 and 21-26 remain in this application. Claim 16 has been canceled. Claim 20 was previously canceled.

Claim 21 has been amended. Claim 26 has been added. Claim 17 has been amended to depend from new claim 26.

The Examiner rejected claims 16-19 as being unpatentable over U.S. Patent No. 5,314,325 to Bosler in view of U.S. Patent No. 4,389,179 to Westcott et al., or over Westcott et al. in view of Bosler. Claim 16 has been cancelled. Claims 17-19 now depend directly or indirectly from new claim 26.

New claim 26 includes essentially the limitations of canceled claim 16 and additionally the limitation of a "shielding means for selectively applying said cooling means to said patterned sheet portion while leaving said remaining portion of said extruded sheet above said heat deflection temperature." As neither Bosler, Westcott et al. or U.S. Patent No. 4,128,369 to Kemerer et al. disclose a shielding means for selectively applying a cooling means to a patterned sheet portion while leaving a remaining portion of said extruded sheet above the heat deflection temperature, new claim 26 should be allowable over these references.

Bosler discloses an apparatus for continuous vacuum forming of an extruded hot plasticized material, such as vinyl, upon a moving flat flexible forming surface, which includes a first and second roller that are continuously rotatably movable. A cooling station may be included which consists of a water spraying means and a water collecting means to facilitate cooling of the finally formed product. As conceded by the Examiner, Bosler does not teach or suggest a shaping means for forming a remaining sheet portion, further cooling means for cooling a remaining sheet portion, or cut-off means. Further, Bosler does not teach or suggest a shielding means for selectively applying the cooling means to a patterned sheet portion while leaving a remaining portion above the heat deflection temperature. Rather Bosler teaches a

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single water spray means (the cooling means) which is not shielded, but rather cools the entire formed sheet at one time.

Wescott et al. teach a machine for making a product from a coiled sheet of thermoplastic polymer. Portions of the polymeric sheet are selectively and sequentially heated and progressively bent to a desired shape by passing the sheet through a series of heating, forming and cooling stations. As admitted by the Examiner, Wescott et al. do not disclose an extruder, a rotating belt means comprising a drive roller, an idle roller and a flexible belt, or a vacuum means for applying vacuum pressure to said extruded sheet through at least said apertures in said mold belt, so as to draw said extruded sheet into intimate forming contact with said mold impression to form a patterned portion and a remaining portion of said extruded sheet while said polymeric material is still hot. Further, although Wescott et al. teach a cooling means which cools only the edge portions of the sheet after they have been heated and formed, this reference does not teach or suggest a separate shielding means for selectively cooling one portion of the sheet while leaving a remaining portion above a heat deflection temperature. Thus, as Wescott et al. teach a process wherein only what has been heated is subsequently cooled, a shielding means for leaving a remaining portion heated is not taught or suggested.

Kemerer et al. disclose a continuous apparatus for impression molding products that includes revolving flexible belt molds having a pattern for molding a thermoplastic material. The apparatus includes a pair of sheet metal housings that shroud the return flights on the belt molds and enclose the coolant applicators so that the belt molds are shrouded from ambient air while they are being cooled by the coolant material. A supplemental cooling station 46 may be located at a downstream end of the molding and cooling channel. Neither the supplemental cooling station 46 nor the sheet metal housings 186 are a shielding means or include a shielding means for selectively applying a cooling means to a particular portion of the sheet. First of all, the supplemental cooling station 46 of Kemerer et al., as discussed in column 13, lines 51-66, is disclosed as including cooling water sprays which are directed against both surfaces of the product material 30a for providing further cooling before the material is led to a cut-off station.

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This description indicates that the whole material is cooled and thus the cooling station does not include any shielding means which selectively applies a cooling means to any particular portion of the sheet. Likewise the sheet metal housings 186 are not a shielding means for selectively applying a cooling means to a particular portion of the sheet. The sheet metal housings are above and below the belt molds and shroud the belt molds from ambient air and do not function to selectively apply the cooling means to any particular portion of the sheet. The coolant application ducts 182 are used to cool the belt molds, and the coolant emitted from the ducts, if it contacts the extruded sheet at all, would not be selectively applied to any particular portion of the sheet, but would rather contact the entire extruded sheet as it would be carried by the entire belt mold to the entire extruded sheet. Therefore, as neither Bosler, Westcott et al. or Kemerer et al. teach or suggest a shielding means as described above, claim 26 should be allowable over these references. As claims 17-19 and 21-26 depend from claim 26, they should be allowable for the same reasons.

Claim 21 was rejected under 35 U.S.C. 103(a) as being unpatentable over Bosler and Westcott et al. and further in view of Kemerer et al. Applicants respectfully traverse this ground of rejection. Claim 21 has been amended to depend from new claim 26 and includes the limitations of the cooling means being a water spray means and the shielding means including a hooded chamber capable of blocking water from the water spray means from contacting the remaining portion of said extruded sheet.

First of all, Kemerer et al. fail to cure the deficiency of both Bosler and Westcott et al. with respect to teaching or suggesting a shielding means for selectively applying a cooling means to a particular portion of the sheet, as was discussed above with respect to new claim 26.

The Examiner contends that the cooling station 46 and sheet metal housings 186 are a hooded chamber to prevent water sprays from contaminating other parts of the apparatus. As discussed above, neither the supplemental cooling station 46 nor the sheet metal housings 186 are described as being a shielding means, nor are such elements capable of blocking water from a water spray means from contacting a remaining portion of the extruded sheet. As stated

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previously, the supplemental cooling station 46 of Kemerer et al. is disclosed as including cooling water sprays which are directed against both surfaces of the product material 30a for cooling the whole material and thus the cooling station would not be capable of blocking water from contacting a separate portion of the extruded sheet. Likewise the sheet metal housings 186 are not a capable of blocking water from contacting a separate portion of the extruded sheet. Referring to column 22, lines 36-47, the sheet metal housings and the coolant application ducts 182 are separated from the extruded sheet by the rotating belt mold, and thus the spray from the ducts are not employed to cool the extruded sheet. As stated above, the ducts are used to cool the belt molds, and any coolant emitted from the ducts which is carried by the belt molds would be carried to the entire extruded sheet, and would not be blocked from contacting any particular portion of the sheet. Therefore, claim 21 should be allowable over these references.

Claims 22-25 were rejected under 35 U.S.C. 103(a) as being unpatentable over Bosler and Westcott et al., and further in view of Borst et al. This ground of rejection is also respectfully traversed. Borst et al. disclose a method and apparatus for holding and feeding a continuous sheet of plastic in a thermoforming process. The apparatus includes crimping wheels for providing a crimped edge to the plastic sheet, and guide rails for stabilizing the sheet as it is moved through the apparatus. An oven applies heat to the plastic sheet and also incidentally applies heat to the guide rails. To dissipate this heat in the guide rails, the guide rails are mounted on heat transfer members having internal channels which are supplied with circulating water from hoses 38, as shown in FIG. 12, to continuously cool the guide rails. The sheet cools in the mold and in the ambient air after it exits from the mold.

Borst et al. fail to cure the deficiency of Bosler, Westcott et al., or Kemerer et al. with respect to new claim 26, from which claim 22-25 depend, as they do not teach or suggest a shielding means for selectively applying a cooling means to a particular portion of the sheet. The guide rails of Borst et al. are not a shielding means for selectively applying a cooling means to a particular portion of the sheet. There is no teaching in Borst et al. that any particular portion of the sheet is cooled while another portion is left heated. Rather, Borst et al. teaches that the

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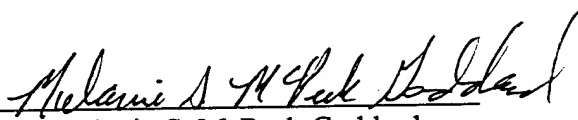
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whole sheet is cooled by natural means. Therefore claims 22-25 should be allowable for the same reasons as given above with respect to claim 26.

In view of the foregoing remarks, Applicants submit that this application is in condition for allowance. Early notification to that effect is respectfully requested.

Respectfully submitted,

DUANE MORRIS LLP

By 
Melanie S. McPeck Goddard
Reg. No. 46,732
Tel: (215) 979-1310